

Competency and Qualifications for ICT Support in Thailand

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Abstract

The Skills Framework for the Information Age (SFIA) is a common framework for professionals in the ICT field. SFIA is a management tool to assist decision makers about the use and development of ICT skills. The SFIA framework is a useful benchmark, but needs to be considered in the context of specific countries. This paper is an investigation into the range of SFIA ICT Service Operation job categories in order to determine the behavioral skills profiles that are important to the Thai ICT industry. This preliminary study is the basis of producing a Thai specific SFIA Service Management framework (strategy, design, transition and operation).

Keywords: SFIA framework, skills, qualifications, service management

Introduction

The Ministry of Information and Communication Technology of Thailand have a strategy to develop the ICT capability of the workforce consistent with market requirements [1]. This strategy is manifested as a 10 year project framework - Building Thailand's Future with ICT (ICT 2020). There are a number of inter-related framework goals that include ICT infrastructure, ICT industry, and ICT human resources, along with an ICT competent workforce, as seen in **Figure 1**. The National ICT Master Plan No. 2 (2009 - 2013) specifies benchmarking to international standards [2].

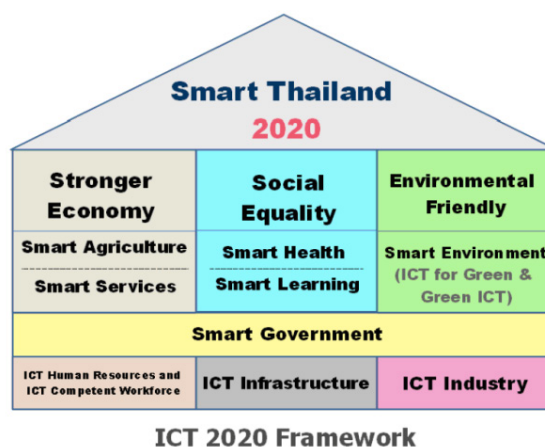


Figure 1 Smart Thailand 2020 [2].

This national framework is designed to ensure appropriate human resource developments are made, to enhance competitiveness nationally and internationally.

The Information and Communication Technology Policy, operating within the timeframe of 2011 - 2020, is designed to benchmark and enhance ICT skills and qualifications in Thailand. A key aspect of this is the use of a skills framework. The Skills Framework for the Information Age (SFIA) provides a standardized definition for both generic and job specific skills in the ICT industry. According to SFIA,

“The foundation of SFIA is a set of generic business skills that make up SFIA’s seven levels of responsibility. The 7 generic levels are recognizable in the workplace. Each level has a full definition expressed in terms of Autonomy, Complexity, Influence and Business skills [3]”.

As such, the SFIA aim is to provide a simple management tool to assist in benchmarking, recruitment, and management of ICT staff. The SFIA framework defines 6 main job categories, each of which is divided into further sub-categories and other sub-categories. For each of the final subcategories, SFIA defines levels of responsibility and accountability. Level 7, the highest, describes levels of responsibility associated with senior positions in industry. By contrast, level 1 represents a novice level. SFIA also provides:

- Skill names
- Skill codes
- Overall descriptions of skills
- Generic definitions of levels
- Skill at a level

SFIA recognizes that the ICT professions represent a combination of knowledge, professional skills, and behavioral skills. According to McClelland, Parry, Spencer, and Spencer, competency in the workplace consists of: knowledge, skills, and personality [4-6].

Knowledge and skills are job specific-knowledge of a specific discipline and the skills to implement that knowledge in a practical sense. By contrast, personality competencies are generic across disciplines. For example, the personality skill ‘team player’ is applicable to civil engineering, production engineering, etc.

The SFIA Framework is the skills framework underlying most international ICT certification programs being implemented around the world by the Society’s kindred partners. It also provides a standard benchmark to ensure true international recognition of a country’s certification program [7]. According to McLaughlin,

“These standards are designed to complement SFIA by adding detailed specifications for performance criteria, knowledge and understanding across all levels. e-Skills UK already has plans in place to continually review and develop the content to ensure that it reflects the changing needs of employers, educators, trainers and other stakeholders [3]”.

This paper is concerned with Service Operations, which is a sub-category of Service Management within the Thai ICT industry.

Correct use of Human Resources drive an economy, and grow a country and make it more competitive [8]. The correct skills are needed in order for a higher mobility of labor to be achieved, in national and international terms. Thailand needs to prepare the labor force to meet the preferred competencies of the domestic and international industrial market. The Association of South East Asian Nations (ASEAN) must abide by the ASEAN Mutual Recognition Arrangement (MRA) [9] in the areas of Engineering, Nursing, Medical Practice, Dental Practice, Surveying, Architectural Services and Accountancy. These specific requirements do not cover information communication and technology (ICT) career paths. As such, organizations have attempted to create an ICT standard skills framework, to be able to satisfy the requirements of the ICT industry in global markets [10].

Therefore, the author aims to study the skill framework of Thai ICT operations by applying SFIA in a way that can be help to prepare for readiness to enter the ASEAN Economic Community (AEC) in 2015. This study also focuses on the improvement and development of Thai skilled labor, which can be matched with “Smart Thailand 2020”. The beneficial outcomes can be expanded on in further study,

which should assist Thailand in opening new opportunities for transferring Thai skilled labor to work in AEC countries.

Materials and methods

The research study “Competency and Qualifications for ICT Support in Thailand” is a quantitative research. The data were collected through questionnaires. The population in this study was composed of personnel in the ICT Support industry in Thailand. The method was divided into 5 regions of Thailand: North, East, South, Central and Bangkok. Respondent companies in the ICT services provider sector were sent questionnaires by post and email. A total of 421 replies were received out of a total of 1,000 questionnaires sent out to the respondents.

In this study, the sample size was set at a confidence level at 95 % and a tolerance level of 5 %, by using the formula of Cochran [11]. It was analyzed using descriptive statistics, including frequency and percentage.

$$n = \frac{1}{\left[\frac{4e^2}{Z^2}\right]} \quad (1)$$

The questionnaire was divided into 2 parts.

Part 01: Personal information, i.e. gender, age, education level, work experience in ICT support, salary, type of company, number of employees in company, operational levels, ICT structure in the company, line organization of responsibility, and necessary skills for ICT career path.

Part 2: Questions on ICT support seen in the 11 fields in **Figure 2**:

1. System software
2. Security administration
3. Radio frequency engineering
4. Applications support
5. IT operations
6. Database administration
7. Storage management
8. Network support
9. Problem management
10. Service desk and incident management
11. IT support/Help desk

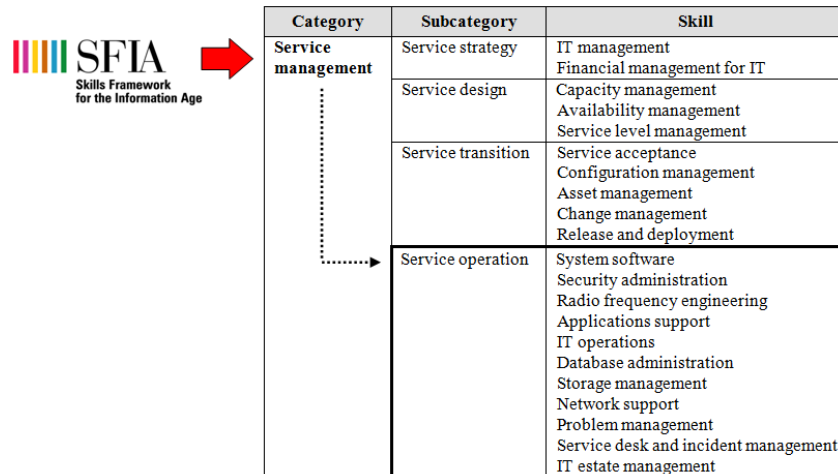


Figure 2 Skills framework for the information age: SFIA.

SFIA defines 11 subcategories within the Service Operations category. However, within Thailand, it was found that only 8 of these categories were relevant, namely:

1. System software
2. Security administration
3. Applications support
4. IT operations
5. Database administration
6. Storage management
7. Network support
8. IT support/Help desk

Results and discussion

The results in this study reported that there are 8 ICT support environments which have been classified in Thailand.

The SFIA framework for all the above categories was analyzed to determine role specific knowledge and skill competencies. It should be noted that these are often used as the basis of job descriptions, as shown on **Table 1**.

Table 1 Knowledge and skills competencies for service operation subcategory.

System software	
Knowledge and Skills Competencies	- Data management in organization, such as addition, editing and deletion of data with tools. - Provision of knowledge about using system software. - Installation, updating and testing of system software updates. - Analysis and evaluation of system software and defining of purpose for software updating. - Survey/Monitoring of work performance and functionality of system software. - Maintenance of software systems in organizations. - Planning for installation and testing of system software.
Security administration	
Knowledge and Skills Competencies	- Provision of knowledge about authority, access data and impacts on various issues for users and experts on the security of the system. - Data access management for users. - Setting of strategies for managing security of system to follow policies of organization. - Making documentation about security system. - Drafting of policies and procedures for administration of standard security systems. - Detection and identification of security violations reports.
Applications support	
Knowledge and Skills Competencies	- Scrutiny of applications for running of operational problems. - Providing advice and training programs to users. - Maintenance of available applications. - Provision of programs appropriate to operations of organizations. - Documentation of program applicationssupport. - Checking of program applications support according to operational processes of organization. - Data collection and reporting of operations.
ICT operations	
Knowledge and Skills Competencies	- Assistance to users under the operation of system. - Installation, maintenance and resolution of applications based on ICT infrastructure (hardware, software and media devices). - Setup/installation/ maintenance- server to be continuously available to client. - Planning of operation to correspond with ICT infrastructure and organization standards. - Backup and recovery of data and identification of problems in implementation and guidelines. - Reporting about network system.
Database administration	
Knowledge and Skills Competencies	- Management/Checking of problems in database. - Installation/Monitoring and maintenance of database. - Ability to use database management system and create tools to collect usage statistics from database. - Creation of manual installation, inspection, maintenance and software upgrading of database. - Preparation of standards for database applications and using of resources to comply with appropriate database operations.
Storage management	
Knowledge and Skills Competencies	- Space management for backup and recovery. - Performance of installation, maintenance and data storage. - Checking of availability of data in applications such as data storage and backup data. - Identification of problems in storage and use of appropriate methods to resolve such problems. - Development of strategies to store data and. sorting of importance of information security to comply with rules. - Planning investment in storage and data management policies of organization. - Creation of standards for data retention on basis of data security. - Preparation of reports of data storage. - Drafting of standards and policies for managing information in organizations.

Network support	
Knowledge and Skills Competencies	- Management of software and tools for checking of network problems. - Analysis and identification of details of problem networks. - Gathering of statistics using network. - Definition of standards and procedures for network support. - Preparation of procedures for maintenance of network support. - Checking of support network to meet standards and procedures. - Provision of advice or training to users about functionality of network system. - Report preparation for application network system.
ICT support/Help desk	
Knowledge and Skills Competencies	- Coordination of rescue operation for problems from system users. - Requirement specification for problems in system. - Making documents for service/support applications. - Drafting of standards and policies for the operation of service and solutions management. - Making schedules for user operations.

The results in this study showed that most participants were male, and aged between 31 and 35 years old. They graduated with a bachelor degree, have working experience in the ICT professional area between 0 and 5 years, and have an average salary of 50,000 Baht per month.

The results also presented an organizational background, for example organizational type, organizational size, and levels of ICT operational positions of participants. Most participants worked for medium organizational sized Thai organizations and have positions in ICT operational levels.

Furthermore, the results found that the respondents worked in ICT support departments which can be grouped as shown in **Figure 3**.

1. IT support/Help desk (332 respondents)
2. IT operations (330 respondents)
3. Applications support (291 respondents)
4. Network support (291 respondents)
5. System software (286 respondents)
6. Security administration (244 respondents)
7. Database administration (231 respondents)
8. Storage management (224 respondents)

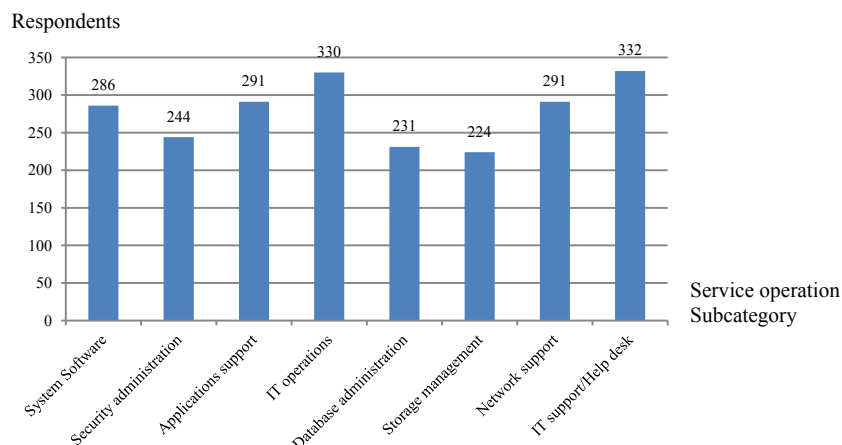


Figure 3 ICT support structure in Thailand.

The common Thai ICT operational positions have been categorized into general soft skills and the SFIA framework as detailed below:

Skill 1: Responsibility for a significant area of work.

Skill 2: Good relationships with colleagues.

Skill 3: Performance of work or daily activities and can seek help if an unexpected user problem occurs in the operation.

Skill 4: Basic information system.

Skill 5: Use of knowledge applied in practice.

Skill 6: Good communications skills with internal and external colleagues, customers, suppliers and partners.

Skill 7: Finding of new knowledge to develop themselves.

Skill 8: Ability to work in a variety of activities.

Skill 9: Can explain the reason for bringing the tools used in the operation and the solution.

Skill 10: Understanding of the business processes to be applied for planning support ICT.

Skill 11: Systematic thinking skills.

Skill 12: Performance of time management obligations.

Skill 13: Technical and project management skills and scheduling performance before and after.

Skill 14: Understanding of the requirements of users, customer and organization.

Skill 15: Knowledge of authority and responsibility for the operation, including financial, technical and quality aspects, and make and apply decisions for themselves and their subordinates. Skill 16: Good command of spoken ability in order to achieve confidence in the solution.

Skill 17: Ability to assess the risks of the technology.

Skill 18: Knowledge of ICT laws.

Skill 19: Understanding of the role and impact on employment.

Skill 20: Knowledge of regulations concerning responsibility for organizational operations.

Skill 21: Ability to define operation strategies to comply with short- and long-term plans of the organization.

Skill 22: Understanding of technology to be accepted and recognized within the industry and within the appropriate ICT environment of business.

The data from the respondents was then analyzed and benchmarked with the SFIA framework. The researcher has grouped the characteristics of ICT Thai competencies and skills. This is shown in **Table 2**.

Table 2 Benchmarking between SFIA and characteristics of Thai competency and skills.

SFIA	Characteristics of ICT Thai competency and skills
7 set strategy, inspire, mobilize	Skills 15 - 22
6 initiate/influence	
5 ensure/advise	Skills 8 - 14
4 enable	
3 apply	Skills 1 - 7
2 assist	
1 follow	

From **Table 3**, the proportion of Thai competency and skills in ICT operational positions is presented by benchmarking with the SFIA framework.

Table 3 SFIA personality competencies ranked by Thai survey for ICT operational positions.

Thai competency and skills in ICT operational positions	SFIA framework		
	Level 1 - 3	Level 4 - 5	Level 6 - 7
System software	40 %	32 %	28 %
Security administration	41 %	32 %	27 %
Applications support	40 %	32 %	28 %
IT operations	41 %	31 %	28 %
Database administration	42 %	31 %	27 %
Storage management	42 %	31 %	27 %
Network support	40 %	32 %	28 %
IT support/Help desk	41 %	31 %	28 %

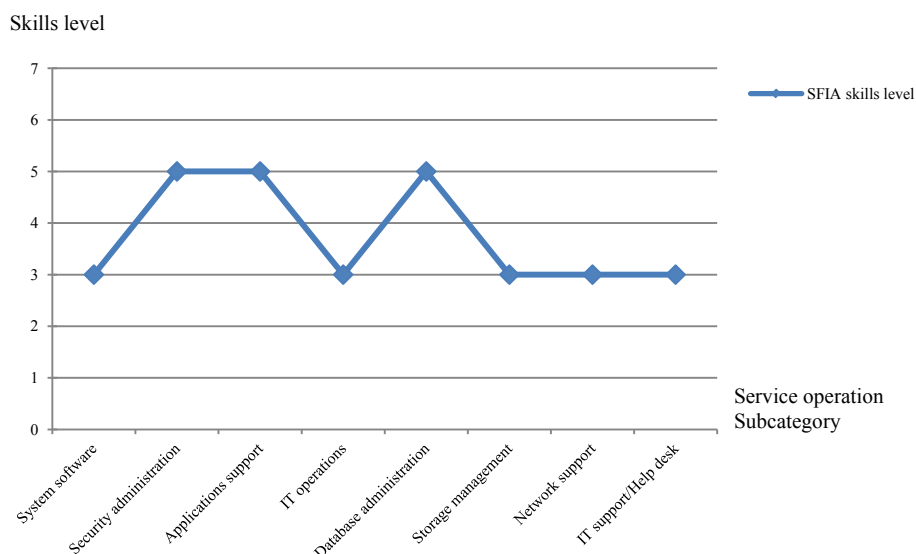


Figure 4 Benchmarking between SFIA framework and characteristics of ICT Thai competencies and skills (22 aspect skills).

In this research, the results obtained illustrate that;

1. From **Table 3**, the characteristics of ICT Thai competencies and skills in levels 1 - 3 of the SFIA framework are found in system software, security administration, applications support, IT operations, database administration, storage management, network support and IT support/help desk positions at an average between 40 - 42 %, levels 4 - 5 of the SFIA framework between 31 - 32 %, and levels 6 - 7 of the SFIA framework between 27 - 28 %, respectively. It can be implied that people who work in these positions should have their overall skills defined as following responsibility for a significant area of work; good relationships with colleagues; performance of work or daily activities; can seek help if an unexpected user problem occurs in the operation; knowledge of basic information systems; use of knowledge applied in practice; good communications skills with internal and external colleagues, customers, suppliers and partners; and finding of new knowledge to develop themselves for SFIA levels 1 - 3. Meanwhile, SFIA levels 4 - 5 should be defined as the ability to work in a variety of activities; can explain the reason for bringing the tools used in the operation and the solution; understanding of the business processes to be applied for planning support ICT; systematic thinking skills; performance of time management obligations; technical and project management skills and scheduling performance before and after; and understanding the requirements of users, customer and organization. Lastly, SFIA levels 6 - 7 should be defined as knowledge of authority and responsibility for the operation, including financial, technical and quality aspects; making decisions for themselves and their subordinates; good command of spoken ability in order to achieve confidence in the solution; ability to assess the risks of the technology; knowledge of to ICT laws; understanding of the role and impact on employment; knowledge of regulations concerning responsibility organizational operations; definition of the operation strategies to comply with the short- and long-term plans of the organization; and understanding of technology to be accepted and recognized within the industry and within the appropriate ICT environment of business.

2. From **Figure 4**, and the benchmarking analysis between the SFIA framework and the characteristics of ICT Thai competencies and skills (22 aspect skills), the results show that level 1 - 3 of the SFIA framework are compatible with ICT Thai skills 1 - 7; levels 4 - 5 of the SFIA framework matched with ICT Thai skills 8 - 14; and levels 6 - 7 of the SFIA framework matched with ICT Thai skills 15 - 22.

3. For skills and knowledge competencies for ICT support in Thailand, there are 8 categories of ICT professionals, namely the system software, security administration, applications support, IT operations, database administration, storage management, network support, and IT support/help desk in service operation subcategories of the SFIA framework. According to Catherine A. Heaney, Richard H. Price, and Jane Rafferty [12], skills and knowledge as a system are required to match the workforce for the basic requirements of the business. They are logical 2-dimensional skills, defined by areas of work on one axis, and levels of responsibility on the other. It has been proven to be an effective resource that benefits business by facilitating all aspects of the management capability in both corporate and educational environments [13].

Conclusions

The competencies and qualifications for jobs are very important for organizations when they need to employ people to work, especially in the ICT Support career. Requirements for skills, knowledge, job characteristics, job descriptions, and job qualifications are necessary and must be outlined clearly in each job position. The service operations category of the SFIA framework defines 11 subcategories. However, in Thailand, it was found that there are only 8 characteristics of ICT support Thai competencies and skills that are relevant, namely: systems software, security administration, application support, IT operations, database administration, storage management, network support and IT support/help desk. These positions have been classified by benchmarking with the SFIA framework and can be defined clearly as job characteristics. By integrating the “competencies and qualifications for ICT support in Thailand” into government strategic plans, the outcomes could be empowered and increase the efficiency of the government sector as a whole, and facilitate the private sector to increase competitiveness to a limitless degree and improve the quality of life of Thai ICT operations instantly. Also, the ICT industries and private sectors can use these outcomes to recruit people and improve ICT job descriptions when they have vacancies in their organizations. It should be pointed that the outcomes can be applied as a standard guideline for ICT national skills and competencies in the future.

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